## REMARKS

The present application was filed on July 25, 2003 with claims 1 through 22. Claims 1 through 22 are presently pending in the above-identified patent application. Claims 11 and 20 are proposed to be amended, and claims 12 and 21 are proposed to be cancelled, without

5   prejudice, herein.

In the Office Action, the Examiner objected to the numbering of the claims. The Examiner rejected claims 11-13 and 20-22 under 35 U.S.C. §102(e) as being anticipated by Phanse et al. (United States Patent Publication Number 2003/0189998), and rejected claims 1-5, 9, 14-16, and 18 under 35 U.S.C. §103(a) as being unpatentable over Choa et al. (United States

10  Patent Number 6,718,087) in view of Wallach et al., "The Least Mean Fourth (LMF) Adaptive Algorithm and its Family," IEEE Trans. Communications on Information Theory, vol. IT-30, no. 2, 275-283 (March 1984). The Examiner indicated that claims 6, 10, 17, and 19 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

15  The specification has been amended to correct typographical errors.

### Formal Objections

The Examiner objected to the numbering of the claims, and has renumbered claims 2-23 as claims 1-22.

### Independent Claims 1 and 14

20  Independent claims 1 and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Choa et al. in view of Walach. Regarding claims 1 and 14, the Examiner acknowledges that Chao fails to teach a least-mean 4Nth-order (LMN) algorithm, where N is greater than one, but asserts that Walach discloses a least-mean $2N^{th}$-order (LMN) algorithm, where K is greater than one (noting that, when k is greater than 1 is a least mean Nth order

25  algorithm; page 275, paragraph 4).

In the text cited by the Examiner (page 275, paragraph 4), Walach did *not consider the benefit of using the LMN algorithm for the optical noise* manifested in the electrical

domain after a photodiode, which is a mixture of a nonzero-mean noncentral $\chi^2$ noise and a signal-dependent non-symmetric Gaussian noise. Walach only considered four special noise types: Gaussian density, uniform density, sinusoidal density, and square wave. Contrary to the Examiner's assertion, *neither Walach nor Choa considered using the LMN algorithm on an*

5 *optical channel.*

In addition, Applicants can find no disclosure or suggestion in either Walach or Choa to combine the techniques of Walach with the invention of Choa. Independent claims 1 and 14 require removing intersymbol interference from said electrical signal using an equalizer, wherein said equalizer has a plurality of coefficients; and updating said plurality of coefficients

10 based upon a least-mean $2N^{th}$-order (LMN) algorithm where N is greater than one.

Thus, Choa et al. and Walach, alone or in combination, do not disclose or suggest removing intersymbol interference from said electrical signal using an equalizer, wherein said equalizer has a plurality of coefficients; and updating said plurality of coefficients based upon a least-mean $2N^{th}$-order (LMN) algorithm where N is greater than one, as required by independent

15 claims 1 and 14.

Independent Claims 11 and 20

Independent claims 11 and 20 were rejected under 35 U.S.C. §102(e) as being anticipated by Phanse et al. Regarding claims 11 and 20, the Examiner asserts that Phanse teaches a slicer to produce a predicted signal in response to each input signal based upon a

20 slicing threshold (FIG. 5b: signal slicer 116b), said slicing threshold is varied based upon a signal distribution of said electrical signal (paragraph 0157).

Independent claims 11 and 20 have been amended to incorporate the features of claims 12 and 21, respectively. In rejecting claims 12 and 21, the Examiner asserted that Phanse teaches a threshold control algorithm to track said signal distribution of said electrical signal and

25 adjust said slicing threshold for a reduced bit error rate of said predicted signal (FIG. 6B: Threshold values 212; paragraph 0243). As the Examiner notes, Phanse teaches to determine the slicer threshold values 212 in paragraph 0243 and FIG. 6B; *Phanse uses the contents of a shift*

*register 214 to determine the slicer threshold value 212. The shift register 214 receives the sliced data 211 as the input.* Independent claims 11 and 20, as amended, require a slicer to produce a predicted signal in response to each input signal based upon a slicing threshold, wherein said slicing threshold is varied based upon a signal distribution of said electrical signal;

5 and a *threshold control algorithm to* **track said signal distribution of said electrical signal** *and* **adjust said slicing threshold** *for a reduced bit error rate of said predicted signal.* Phanse does not disclose or suggest **tracking the signal distribution of the electrical signal and adjusting the slicing threshold** *for a reduced bit error rate of said predicted signal.*

Thus, Phanse et al. do not disclose or suggest a slicer to produce a predicted

10 signal in response to each input signal based upon a slicing threshold, wherein said slicing threshold is varied based upon a signal distribution of said electrical signal; and a threshold control algorithm to track said signal distribution of said electrical signal and adjust said slicing threshold for a reduced bit error rate of said predicted signal, as required by independent claims 11 and 20, as amended.

15 <u>Dependent Claims 2-10, 12-13, 15-19 and 21-22</u>

Dependent claims 12, 13, 21, and 22 were rejected under 35 U.S.C. §102(e) as being anticipated by Phanse et al., and claims 2-5, 9, 15, 16, and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Choa et al. in view of Eugene Walach.

Claims 2-10, 13, 15-19, and 22 are dependent on claims 1, 11, 14, and 20,

20 respectively, and are therefore patentably distinguished over Phanse et al., Choa et al., and Eugene Walach, because of their dependency from amended independent claims 1, 11, 14, and 20 for the reasons set forth above, as well as other elements these claims add in combination to their base claim. The Examiner has already indicated that claims 6, 10, 17, and 19 would be allowable if rewritten in independent form including all of the limitations of the base claims and

25 any intervening claims. Claims 12 and 21 have been cancelled.

All of the pending claims following entry of the amendments, i.e., claims 1-11, 13-20, and 22, are in condition for allowance and such favorable action is earnestly solicited.

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If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The Examiner's attention to this matter is appreciated.

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Respectfully submitted,

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